

Variation Theory and Mixed Instructional Approaches: Advancing Conceptual Understanding in Geometry

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Abstract : The study aimed to examine students' problem-solving skills through mixed instruction (variation theory based Geogebra assisted problem-solving instructional approaches). A total of 125 students divided into 4 intact groups participated in the study. The study employed a quasi-experimental research design. Three intact groups were randomly assigned as a treatment group, while one group was taken as a comparison group. Each of the groups took a specific instructional approach, while the comparison group proceeded as usual without any changes to the instructional process for all sessions. Both pre and post problem-solving tests were administered to all groups. To analyze the data and examine the differences (if any) in each group, ANCOVA and Paired samples t-tests were employed. There was a significant mean difference between students pre-test and post-test in their conceptual understanding of each treatment group. Furthermore, the mixed treatment had a large mean difference. It was recommended that teachers give attention to using variation theory-based geometry problem-solving approaches for students' better understanding. Administrators should emphasize launching Geogebra software through IT labs in schools, and government officials should appreciate the implementation of technology in schools.

Keywords : conceptual understanding, Geogebra, learning geometry, problem solving approaches, variation theory

Conference Title : ICTES 2024 : International Conference on Teaching and Education Sciences

Conference Location : Las Vegas, United States

Conference Dates : November 11-12, 2024